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NOTICE OF ALLOWANCE AND FEE(S) DUE

20457 7590 03/03/2011
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

BOR, HELENE CATHERINE

ART UNIT

PAPER NUMBER

3768

DATE MAILED: 03/03/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/565,435 01/20/2006

Tetsuya Hayashi

529.45793X00

2189

TITLE OF INVENTION: ULTRASONOGRAPHIC DEVICE AND ULTRASONOGRAPHIC METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	06/03/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE** OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail

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or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the **ISSUE FEE** and **PUBLICATION FEE** (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,435	01/20/2006	Tetsuya Hayashi	529.45793X00	2189

TITLE OF INVENTION: ULTRASONOGRAPHIC DEVICE AND ULTRASONOGRAPHIC METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	06/03/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
BOR, HELENE CATHERINE	3768	600-443000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB-112) attached;
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB-112, Rev. 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, _____ 1
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. _____ 2
_____ 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.111. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reuply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims **SMALL ENTITY** status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming **SMALL ENTITY** status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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10/565,435	01/29/2006	Tetsuya Hayashi	529.45793X00	2189

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 14 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 14 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability**Application No.**

10/565,435

Applicant(s)

HAYASHI ET AL.

Examiner

HELENE BOR

Art Unit

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendments filed 12/15/2010.
2. ☒ The allowed claim(s) is/are 1-3,5-9 and 11-20.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date ____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Leonid Thenor on 02/24/2010.

The application has been amended as follows:

1. An ultrasound diagnostic apparatus comprising:

a tomogram forming ~~means~~ unit for forming a tomogram of a diagnosis portion of an examinee by transmitting/receiving an ultrasound wave to/from the examinee via an ultrasound probe;

color Doppler image forming ~~means~~ unit for forming a color Doppler image based on a Doppler signal obtained from the diagnosis portion;

a transparency control ~~means~~ unit for controlling a degree of the transparency of the color Doppler image;

an image processing unit for performing image processing on the tomogram and the color Doppler image;

a display unit for displaying images obtained by the image processing unit, the tomogram and the color Doppler image being color displayed on the display unit,

selection means unit for selecting one or both of a luminance/hue color bar, which is based on the information of a velocity and/or variance of a blood flow, and/or a transparency color bar from a plurality of transparency color bars, which is based on the information of the variance, for alternatively or simultaneously displaying the luminance/hue color bar and/or the transparency color bar on the display ~~means~~ unit; and

image processing means for performing image processing on the tomogram and the color Doppler image; and

~~display means for displaying images obtained by the image processing means, the tomogram and the color Doppler image being color displayed on the display means,~~

wherein the transparency control means unit for controlling a degree of transparency changes the relationship between the transparency and the variance, and changes the degree of transparency of the color Doppler image based on the changed relationship in accordance with the one transparency color bar selected by the ~~means for selecting~~ selection unit,

the image processing ~~means~~ unit causes the color Doppler image to be displayed transparently, based on the changed degree of transparency, and

the display ~~means~~ unit displays at most the one transparency color bar selected by the ~~means for selecting~~ selection unit.

2. The ultrasound diagnostic apparatus according to claim 1, wherein the display

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~~means unit~~ displays information composed of the color display and the transparent display.

3. The ultrasound diagnostic apparatus according to claim 1, further comprising a second ~~means unit~~ for selecting one of the color display and the transparent display, wherein the display ~~means unit~~ displays the information selected by the second ~~means unit~~ for selecting.

5. The ultrasound diagnostic apparatus according to claim 1, wherein the ~~means for controlling a degree of transparency~~ control unit controls a degree of the transparency based on blood flow information of the color Doppler image.

6. The ultrasound diagnostic apparatus according to claim 1, wherein the ~~means for controlling a degree of transparency~~ control unit controls a degree of the transparency based on a variance of a blood flow of the color Doppler image.

7. The ultrasound diagnostic apparatus according to claim 1, wherein the ~~means for controlling a degree of transparency~~ control unit sets the transparency of the color Doppler image in such a manner that the transparency is reduced with an increase in a variance of the blood flow.

8. The ultrasound diagnostic apparatus according to claim 1, wherein the ~~means for~~

~~controlling a degree of transparency~~ control unit obtains the variance as a relative value to display the color Doppler image as: an opaque image when the variance is maximum; a transparent image when the variance is null; or a semi-transparent image when a variance is not maximum nor null.

9. The ultrasound diagnostic apparatus according to claim 1, wherein the display ~~means~~ unit displays a transparent color bar representing the transparency of the color Doppler image of the color display.

11. The ultrasound diagnostic apparatus according to claim 1, further comprising a luminance/hue control means unit for controlling a hue of the color Doppler image of the color display, wherein the ~~means for controlling a degree of transparency control unit~~ and the luminance/hue control means unit for controlling a hue controls a luminance, a hue, and a transparency based on the blood flow information to create a three-dimensional color Doppler image.

12. The ultrasound diagnostic apparatus according to claim 11, further comprising:
~~means~~ an arranging unit for arranging a speed/reflection intensity and variance data of the Doppler signal in each of three-dimensional voxels in accordance with a position of each of planes;
~~means~~ a luminance/hue deciding unit for deciding a luminance/hue of each of the three-dimensional voxels based on the speed and a variance; and

~~means~~ a transparency deciding unit for deciding a transparency of each of the three-dimensional voxels based on the variance.

13. The ultrasound diagnostic apparatus according to claim 11, wherein the display ~~means~~ unit displays a turbulence portion of the blood flow of the three-dimensional color Doppler image.

14. The ultrasound diagnostic apparatus according to claim 1, wherein the color Doppler image forming ~~means~~ unit comprises:
a phase comparator outputting a cosine component and a sine component of the Doppler signal;
an MTI filter damping a low frequency component of the cosine component signal and the sine component signal and extracting a high frequency component of the cosine component signal and the sine component signal;

an autocorrelation calculation ~~means~~ unit calculating an average speed, a variance, and power of the blood flow;

a digital scan converter rearranging in accordance with a television scanning method; and

a color encoder performing colorization corresponding to the speed and the variance.

15. The ultrasound diagnostic apparatus according to claim 1, comprising a

luminance/hue display unit means for displaying a luminance/hue color bar representing a color of the color Doppler image of the color display,

wherein the luminance/hue color bar changes in color in such a manner that: black is displayed at a portion corresponding to the blood flow speed of 0; the change in the case of a positive direction speed is displayed as a gradual change from dark red to orange and then to yellow in accordance with the increase in variance; and the change in the case of a negative direction speed is displayed as a gradual change from dark blue to light blue and then to green in accordance with the increase in variance.

16. (previously presented) The ultrasound diagnostic apparatus according to claim 1, wherein the image processing ~~means~~ unit comprises a storage unit means for storing data of a plurality of color Doppler images and reads out the data from the storage unit means to perform the image processing on the data of speeds, reflection intensities, and variances of the plurality of the color Doppler images.

18. The ultrasound diagnosing method according to claim 17, further comprising the steps of:

measuring a plurality of color Doppler images;

~~arranging step for~~ arranging speed/reflection intensity and variance data of the color Doppler images in each of three-dimensional voxels corresponding to each of planes;

deciding color information of a luminance/hue of each of three-dimensional voxels based on the speed and the variance;

deciding a transparency of each of the three- dimensional voxels based on the variance; and

~~rendering step for~~ performing volume rendering based on parameters decided by the foregoing steps and creating a projection image to be displayed.

19. The ultrasound diagnostic apparatus according to claim 1, wherein the plurality of color Doppler images are acquired and ~~they are~~ subjected to volume rendering so as to create a projection image to be displayed.

20. The ultrasound diagnostic apparatus according to claim 19, further comprising:

~~means~~ a measuring unit for measuring a plurality of color Doppler images;

~~means~~ an arranging unit for arranging speed/reflection intensity and variance data of the color Doppler images in each of three-dimensional voxels corresponding to each of planes;

~~means~~ a luminance/hue deciding unit for deciding color information a luminance/hue of each of three-dimensional voxels based on the speed and the variance;

~~means~~ a transparency deciding unit for deciding a transparency of each of the three- dimensional voxels based on the variance; and

~~means~~ a rendering unit for performing volume rendering based on parameters decided by the foregoing steps and creating a projection image to be displayed.

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HELENE BOR whose telephone number is (571)272-2947. The examiner can normally be reached on M-T 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Helene Bor/
Examiner, Art Unit 3768

/Long V Le/
Supervisory Patent Examiner, Art Unit 3768